

## REMARKS/ARGUMENTS

Applicants' counsel wishes to thank the Examiner and her supervisor for the interview with Applicants' counsel on September 11, 2007. Although no agreement on allowable subject matter was reached at that time, Applicants' counsel gained a greater appreciation for the positions taken in the non-Final Office Action of June 21, 2007.

The non-final Office Action of June 21, 2007 and the Examiners' interview comments have been carefully reviewed and these remarks are responsive thereto. Independent claims 23 and 24 have been amended with additional language to that presented during the interview to clarify a feature of the invention. Claims 23-40 are pending, and allowance of these claims is respectfully requested.

In the non-final Office Action, the Response to Arguments item v) stated that in the claims presented prior to the Office Action, the "features upon which applicant relies (i.e., while lemon lime beverages become more stable at higher pHs, the tartness of higher pH beverages is unacceptable (sic, unacceptably compromised)" were not recited in the rejected claims. It is respectfully submitted that the claims as amended in the present Amendment recite the features upon which applicants rely for patentability over the prior art.

### Rejection under 35 U.S.C. 103(a)

Claims 23-30 and 33-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al. in view of combination of Van Ness and Nakel et al.

Claims 31 and 32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al. in view of combination of Van Ness and Nakel et al. as applied above further in view of Lee et al.

Independent claims 23 and 24 have been amended as follows:

23. (Currently Amended) A method of ~~improving the stability of lemon/lime flavor of a lemon/lime flavored beverage, while also maintaining or increasing the tartness of the lemon/lime beverage,~~ comprising the steps of:

- (a) including in the a lemon/lime flavored beverage an acidulant system consisting of (i) citric acid and (ii) adipic acid having a smaller dissociation constant than citric acid; and
- (b) increasing the pH of the lemon/lime flavored beverage by including in the lemon/lime flavored beverage a buffer salt system consisting of a citrate salt and a phosphate salt, wherein the ratio by weight of said adipic acid : said citric acid is 1 : 15 to 1 : 3, and wherein the stability of the lemon/lime flavor of the beverage is improved by increasing the pH of the lemon/lime flavored beverage while also maintaining or increasing the tartness of the beverage over the same beverage without said ratio of said adipic acid to said citric acid.

24. (Currently Amended) A method of improving the stability of lemon/lime flavor of a lemon/lime flavored beverage, while also maintaining or increasing the tartness of the lemon/lime beverage, comprising the steps of:

- (a) including in the a lemon/lime flavored beverage an acidulant system consisting of (i) a combination of phosphoric acid and citric acid and (ii) adipic acid having a smaller dissociation constant than both phosphoric acid and citric acid; and
- (b) increasing the pH of the lemon/lime flavored beverage by including in the lemon/lime flavored beverage a buffer salt system consisting of a citrate salt and a phosphate salt, wherein the ratio by weight of said adipic acid : said phosphoric acid : said citric acid is 3.0-4.0 : 1.4-2.0 : 1.0, and wherein the stability of the lemon/lime flavor of the beverage is improved by increasing the pH of the lemon/lime flavored beverage while also maintaining or increasing the tartness of the beverage over the same beverage without said ratio of said adipic acid to said phosphoric acid to said citric acid.

As noted in the Background of the present application (*see* paragraphs [0007] and [0010]), while lemon/lime flavor in lemon/lime flavored beverages becomes more stable at higher pHs, the tartness of higher pH beverages is unacceptably compromised. *See* Freeburg, et al., *Perfumer & Flavorist*, vol. 19, pp. 23-32 (1994) (courtesy copy attached), cited in paragraph

[0007] of the present application and submitted in an Information Disclosure Statement dated February 12, 2004: "Lemon oil is very unstable and deteriorates rapidly during storage at low pHs." As noted in the Background of the present application, prior to the present invention, it was difficult to produce a lemon/lime flavored beverage with a good shelf life. *See* paragraphs [0007] and [0010].

The Background of the present application further notes that in addition to the problems associated with shelf life, the instability of lemon/lime flavor at lower pHs limits the applications to which lemon/lime flavor can be applied (*see* paragraph [0008]). As specifically noted in paragraph [0008] of the present application:

For example, cola beverages are typically formulated to a pH of about 2.5 to 2.8 using two acidulants, namely phosphoric acid and citric acid, and sodium or potassium citrate as a buffering salt. Due to the low pH, it is not possible to make a good tasting, storage-stable lemon/lime flavored cola drink by simply adding lemon/lime flavor to such a conventionally formulated cola drink since the lemon/lime flavor will degrade and compromise the overall flavor of the cola.

As noted in the Background of the present application:

[0010] Hence, there exists a dilemma in the formulation of lemon/lime flavored beverages. There are competing interests (1) to raise the pH significantly to improve the stability of lemon/lime flavor and (2) to maintain or increase the tartness perception commonly associated with the lemon/lime flavor. In short, there is a need for good tasting, storage-stable lemon/lime flavored beverages.

The Office Action does not dispute the above statements in the present application. The claimed method provides a solution to the dilemma in the formulation of lemon/lime flavored beverages. There is no teaching in any of the cited references, either alone or in combination of

a method including “increasing the pH of the lemon/lime flavored beverage by including in the lemon/lime flavored beverage a buffer salt system consisting of a citrate salt and a phosphate salt, wherein the ratio by weight of said adipic acid : said citric acid is 1 : 15 to 1 : 3, and wherein the stability of the lemon/lime flavor of the beverage is improved by increasing the pH of the lemon/lime flavored beverage while also maintaining or increasing the tartness of the beverage over the same beverage without said ratio of said adipic acid to said citric acid” as claimed in claim 23.

As recognized in the Office Action, “Braun is silent as to the specific amount of adipic acid in a lemon-lime beverage.” Braun is also silent on any method to improve the stability of lemon/lime flavor of a lemon/lime flavored beverage by increasing the pH of the lemon/lime flavored beverage while at the same time maintaining or increasing the tartness of the lemon/lime beverage over the same beverage without the claimed ratio of adipic acid to citric acid.

Van Ness and Nakel, like Braun, are also silent on any method to improve the stability of lemon/lime flavor of a lemon/lime flavored beverage by increasing the pH of the lemon/lime flavored beverage while at the same time maintaining or increasing the tartness of the lemon/lime beverage over the same beverage without the claimed ratio of adipic acid to citric acid.

Van Ness does not teach any method to improve the stability of lemon/lime flavor of a lemon/lime flavored beverage by increasing the pH of the lemon/lime flavored beverage while at the same time maintaining or increasing the tartness of the lemon/lime beverage over the same beverage without the claimed ratio of adipic acid to citric acid.

Nakel does not even mention adipic acid, let alone a ratio of adipic acid to citric acid being 1:15 to 1:3. Nakel does not teach any method to improve the stability of lemon/lime flavor of a lemon/lime flavored beverage by increasing the pH of the lemon/lime flavored beverage while at the same time maintaining or increasing the tartness of the lemon/lime beverage over the same beverage without the claimed ratio of adipic acid to citric acid.

One of ordinary skill in the art would expect that increasing the pH of a lemon-lime or cola beverage would improve the stability of the beverage, but that doing so would reduce the tartness of the beverage. One of ordinary skill in the art would expect this reduction in tartness of a lemon/lime beverage when the pH is raised regardless of whether or not adipic acid is added in addition to or in place of an amount of citric acid in the beverage. Thus, the method of the present invention yields much more than a predictable result. Indeed, the method of the present invention solves a dilemma in the industry dating back to at least 1994 (the date of Freeburg, et al., Perfumer & Flavorist, vol. 19, pp. 23-32 (1994), cited in paragraph [0007] of the present application).

One of ordinary skill in the art would not be motivated to modify the lemon-lime or cola beverage taught by Braun to contain adipic acid (either in addition to or in place of citric acid as taught by Van Ness) in a particular ratio to citric acid of 1:15 to 1:3, while keeping the total acid of the beverage in the desired range using the formula taught in Nakel, and also increase the pH of the beverage to improve the stability of the beverage because one of ordinary skill in the art would expect that such a method would result in a beverage with unacceptably compromised tartness.

While the Braun and Van Ness may teach that adipic acid can be used in a beverage, there is no teaching in any of the cited art that a specific ratio by weight of adipic acid to citric acid can solve the problem of tartness of a lemon/lime flavored beverage being unacceptably compromised when the pH of the lemon/lime flavored beverage is raised to make the beverage more stable. The prior art provides no guidance whatsoever, as to which acid combination and ratio by weight of acids within such an acid combination could possibly solve the above tartness problem when the pH of a lemon/lime flavored beverage is increased to improve stability of the beverage.

Thus, one of ordinary skill in the art would not have been motivated by a combination of Braun, Van Ness and Nakel, to practice the method of independent claim 23. Even if one of ordinary skill in the art was motivated to combine Braun, Van Ness and Nakel, the proposed combination does not result in the claimed invention. None the cited art, either alone or in

combination, teaches the method including “increasing the pH of the lemon/lime flavored beverage by including in the lemon/lime flavored beverage a buffer salt system consisting of a citrate salt and a phosphate salt, wherein the ratio by weight of said adipic acid : said citric acid is 1:15 to 1:3, and wherein the stability of the lemon/lime beverage is improved by increasing the pH of the lemon/lime flavored beverage while also maintaining or increasing the tartness of the beverage over the same beverage without said ratio of said adipic acid to said phosphoric acid to said citric acid” as claimed in claim 23.

The same reasoning applies as to why independent claim 24, which claims a specific ratio by weight of adipic acid to phosphoric acid to citric acid, is patentable over the cited art.

The present application provides clear and convincing evidence of patentability of the pending claims. Specifically, the present application provides comparison testing that proves the claimed method improves the stability of lemon/lime flavor of a lemon/lime flavored beverage, while also maintaining or increasing the tartness of the lemon/lime beverage. *See* paragraphs 30-33, setting forth Examples 1 and 2 (embodiments of the claimed invention, having a pH of 3.43 and 3.55, respectively), paragraphs 36-39 (Comparative Examples 1 and 2 (controls), having a pH of 2.74 and 3.2, respectively), and paragraphs 40-42 (taste testing comparison between embodiments of the claimed invention and the controls).

As noted in paragraph 41 of the present application, when a panel of cola experts tasted the embodiment of Example 1 and control Comparative Example 1 immediately upon manufacture, i.e., fresh beverages, the experts adjudged the drinks Example 1 to be more tart. Seven months after manufacture, a panel of cola experts re-evaluated the cola drinks made according to Example 1 and Comparative Example 1, and unanimously found the flavors in the drinks of Comparative Example 1 had decomposed significantly, rendering the drink quality unacceptable. On the contrary, the drinks according to Example 1 were judged as more tart and had acceptable flavor and taste. One of ordinary skill in the art would have expected that Example 1 having a pH of 3.43 upon its manufacture would have less tartness than Comparative Example 1 having a pH of 2.74 upon its manufacture – not the opposite as shown in present application.

As noted in paragraph 42 of the present application, a panel of lemon/lime flavored carbonated soft drink experts tasted 4-week old drinks made according to Example 2 and Comparative Example 2. The experts adjudged the drinks of Example 2 to be more tart and have a stronger lemon/lime taste. One of ordinary skill in the art would have expected that Example 2 having a pH of 3.55 upon its manufacture would have less tartness than Comparative Example 2 having a pH of 3.02 upon its manufacture – not the opposite as shown in present application.

In view of the foregoing, it is respectfully submitted that independent claims 23 and 24 are patentable over the prior art. The dependent claims are patentable for at least the same reasons that independent claims 23 and 24 are patentable, and for the additional features recited therein.

As noted in the Background of the present application, Lee U.S. Patent 5,348,756 relates to gelatin gels and powdered mixes therefore only. Lee does not remedy the deficiencies in Braun, Van Ness or Nakel. Lee does not teach a method including “increasing the pH of the lemon/lime flavored beverage by including in the lemon/lime flavored beverage a buffer salt system consisting of a citrate salt and a phosphate salt, wherein the ratio by weight of said adipic acid : said citric acid is 1:15 to 1:3, and wherein the stability of the lemon/lime beverage is improved by increasing the pH of the lemon/lime flavored beverage while also maintaining or increasing the tartness of the beverage over the same beverage without said ratio of said adipic acid to said phosphoric acid to said citric acid” as claimed in claim 23. The same reasoning applies as to why independent claim 24, which claims a specific ratio by weight of adipic acid to phosphoric acid to citric acid, is patentable over the cited art. Thus, dependent claims 31 and 32 are patentable over the prior art.

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Reply to Office Action of June 21, 2007

**Conclusion**

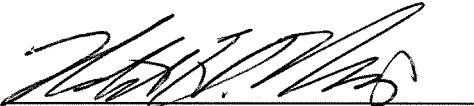
In view of the foregoing, it is respectfully submitted that pending claims 23-40 are in condition for allowance. The Examiner is invited to contact the undersigned at the telephone number provided below, should it be deemed necessary to facilitate prosecution of the application.

Respectfully submitted,

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